

Pamphlet
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Engineering and Design
GUIDELINES FOR THE CAREER DEVELOPMENT
OF GEOTECHNICAL ENGINEERS

1. Purpose.

a. The US Army Corps of Engineers (USACE) must continue to develop and maintain a highly-trained and experienced geotechnical staff to support the engineering activities associated with the civil works program. The guidance in this pamphlet describes the experience, education, training, and skill development opportunities that Corps geotechnical members should have to ensure that USACE maintains the essential geotechnical capabilities required to support the USACE planning, design, construction, operation and dam safety mission. This information should be used by geotechnical engineers in USACE in the preparation of Individual Development Plans (IDP) for their individual career development especially in the technical arena.

b. The Army Civilian Training, Education and Development (ACTEDS) (reference 3g) provides guidance on the types of experience, training, education, and career planning which are recommended for progression to the key leadership positions in the career program. However, the principal emphasis of ACTEDS is on developing leadership and management skills. The guidance provided in this pamphlet provides guidelines for development of technical and professional skills which are not detailed in the ACTEDS. The two documents

should be used together to help managers and careerists develop organizational and individual development plans for technical and supervisory positions in geotechnical engineering in USACE.

c. This pamphlet should be used as guidance for development of individual career plans. The experience, education, training, and skill development opportunities suggested are those considered necessary for the member to perform the assigned tasks; however, the suggested experiences are not to be considered as absolute requirements.

2. Applicability. This pamphlet applies to all USACE elements having civil works responsibilities.

3. References.

a. AR 690-1-950, Civilian Personnel Career Management, Chapter 11.

b. DA Pamphlet 690-43, Supervisors Guide to Career Development and Counseling for Career Program Employees.

c. DA Pamphlet 690-46, Mentoring.

d. ER 350-1-416, Headquarters, US Army Corps of Engineers (HQUSACE) Centrally and Locally Sponsored Long-Term

(LTT) Program.

e. ER 350-1-420, 5 - Year IDP and Development Assignments.

f. ER 690-1-958, Army Civilian Career Program for Engineers and Scientists (Resources and Construction).

g. Memorandum, CEHR-C, 3 December 1990, Subject: Army Civilian Training, Education and Development (ACTEDS) for Engineers and Scientists.

4. Distribution. Approved for public release, distribution is unlimited.

5. Responsibilities.

a. Professional development of the geotechnical workforce is both the ongoing responsibility of the Corps of Engineers and the individual Corps geotechnical member. By fostering individual professional development through training, education, and/or developmental opportunities that are directly linked to the job responsibilities, the Corps enhances development of its corporate workforce. A viable, proactive corporate professional development plan promotes optimum performance of team members in their present jobs and provides a reservoir of job skills to meet future Corps needs, while providing careerists opportunities to achieve career goals.

b. Supervisors, managers and Career Program Managers are responsible for making the careerist aware of career development programs and providing opportunities to meet corporate needs, but the ultimate responsibility for career development rests with the careerist.

In order to be qualified to assume or apply for positions when the opportunity arises, particularly for those positions with advancement potential, the careerist should develop an individual development plan which states career goals, identifies specific positions associated with those goals and includes any training, education, or skill development required for desired positions. The plan should provide for attainment of plan objectives in a deliberate, progressive manner. While many opportunities for professional and career development are available to the member at Corps expense during work hours, the careerist should also consider opportunities that are available at individual expense during non-work hours.

6. Nature and Scope of Geotechnical Engineering.

a. Geotechnical engineering is that portion of civil engineering that deals with all aspects of the theory and practice of soil mechanics. In particular, it includes the following activities for the planning, design, construction, operation, and rehabilitation of civil works projects: site evaluation, selection and characterization; subsurface investigations and exploration; institute and laboratory testing; foundation design for embankments and other major structures; design of earth and rock-fill dams; levee design; seepage investigations, dewatering and seepage control systems; developing performance parameters; instrumentation and monitoring systems; pavement design; forensics and performance evaluation; and the engineering evaluation and designation of natural construction materials for use as construction materials.

b. The scope includes all field

investigations; laboratory and field testing; design of geotechnical features including analyses and documentation; technical review; development of contract documents and instructions to construction personnel; coordination and visits to construction sites; and monitoring and evaluation of the performance of completed civil works structures.

c. The Corps of Engineers has technical capability requirements which are unique to the mission. To satisfy these requirements, the Corps must maintain a cadre of trained and experienced professional geotechnical engineers to ensure safe design, construction and operation of dams, levees and other flood control projects. Examples of these essential technical capabilities are:

- (1) exploration and testing for dams and levees,
- (2) foundation design for dams and levees,
- (3) embankment design for dams and levees,
- (4) seepage evaluations and groundwater modeling,
- (5) design of dewatering, seepage and uplift control systems,
- (6) emergency response for flood fighting and evidence of distress,
- (7) developing performance parameters for embankment dams and levees,
- (8) monitoring actual performance of embankment dams and
- (9) evaluation and testing of construction materials for embankment dams and levees for design and construction control.

d. Technical tasks performed by geotechnical engineers from entry level GS-5/7/9 through GS/GM-15 managers are defined in Appendix A. Knowledge, skills, and abilities (KSA) which the geotechnical team member must possess in order to perform these tasks are listed in Appendix B. These tasks and competencies were identified by a group of highly experienced geotechnical Corps members selected from both field and headquarters organizations with varied geotechnical responsibilities. Additionally, the tasks were verified through a survey in which every USACE organization with geotechnical capabilities had the opportunity to participate.

7. Professional Development.

a. *General.* Professional development is multifaceted. It may include, but certainly is not limited to, formal academic education, short-term and long-term training, seminars, correspondence courses, on-the-job training, on-the-job developmental assignments, developmental assignments on other than assigned job, and involvement in professional societies, associations, and activities. Appendix C lists the professional development considered necessary for the geotechnical careerist to acquire the technical competencies, defined by the KSAs, which are needed to perform essential tasks at a given grade level. The professional development requirements have been divided into three categories: formal training, on-the-job training, and developmental assignments. These categories are discussed below.

b. Formal training.

(1) Short-term training. This type of training usually consists of organized study

offered as short courses by various government sources (i.e., the Proponent-Sponsored Engineer Corps Training Program (PROSPECT) courses) and nongovernment vendors in a traditional classroom setting. Officially, short-term training is less than 120 days in duration. The length of short-term training varies. Also included in this category are formal correspondence courses and developmental assignments or programs less than 120 days in duration. (For the purposes of this guidance, developmental assignments are listed separately from formal training.)

(2) Long-term training. Training and education to which a member is assigned on a continuous, full-time basis for more than 120 calendar days is counted as long-term training. Selection of members for long-term training is competitive. The assignment may be to either Government or non-Government facilities, such as the senior service colleges, fellowship programs, and university programs. (For the purposes of this guidance, developmental assignments are listed separately from formal training.) See ER 350-1-416 for additional information on long-term training.

c. *On-the-job training.* On-the-job training (OJT) is one of the most effective ways to learn a new task/skill. OJT may consist of intensive short-term instruction and practice or may be a long-term continuous process. While the OJT does not have to take the form of traditional formal instruction, the OJT should be planned to teach essential elements of the task/skill in a sequential manner which will facilitate learning. As the name implies, OJT is done at the job site, usually in a one-on-one situation between the learner and a skilled task performer who serves

as a mentor for the learning of that task/skill. Positive aspects of OJT include the opportunity to learn the task/skill from a member who currently performs the task, the opportunity to perform the task on an actual project while using actual materials and equipment, the mentor's review of the learner's work, and the feedback provided by the mentor to the learner.

d. *Developmental assignments.* Temporary assignments to different positions can provide the opportunity for a careerist to develop new knowledge, skills, and abilities in a job situation. The knowledge, skills, and abilities may lead to future capabilities for the organization as well as foster individual career development. Developmental assignments of less than 120 days are counted as short-term, while assignments in excess of 120 days are counted as long-term training. (See paragraphs 7b (1) and (2) above.)

8. Professional Registration. Professional registration in a state of an individual's choice should be a career goal of each geotechnical engineer. AR 690-1-950, Chapter 2 identifies key positions in the district, MSC and Headquarters which require professional engineer registration. Team members aspiring to fill one of these key positions should include development of knowledge, skills, and abilities which would enable them to acquire the required registration in their IDPs.

9. Professional Society Participation. Participation in a professional society or organization provides for the exchange of technical information and experiences with other federal and private practice geotechnical engineers. Geotechnical engineers are encouraged to be active members in the

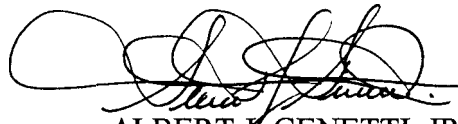
professional societies of their choice. Membership in these organizations provides self-development, enhances the individual's professional network and assists in maintaining state-of-the-art technical knowledge and capabilities in USACE.

10. USACE Technical Committees. Geotechnical engineers are encouraged to actively participate as a member of USACE technical committees and task groups. These activities assist in the evaluation of methods, procedures, and practices in USACE and the civil engineering profession for applicability in the design construction, and operation of civil works projects. Task groups also assist in establishing technical criteria and standards by drawing on the individual experiences and expertise in the geotechnical community.

FOR THE COMMANDER:

3 Appendices
APP A- Geotechnical Technical and
Managerial Task Inventory
APP B- Knowledge, Skills and Abilities
APP C- Technical Career Development Plan
for Geotechnical Engineers

11. Summary. The individual employee is responsible for establishing his or her career goals and developing the plan to achieve them. The immediate supervisor is responsible to guide and advise the employee and provide appropriate assignments consistent with the IDP. Senior geotechnical engineers should make themselves available to serve in the role of mentor for new engineers.



ALBERT V. GENETTI, JR.
Major General, USA
Chief of Staff